

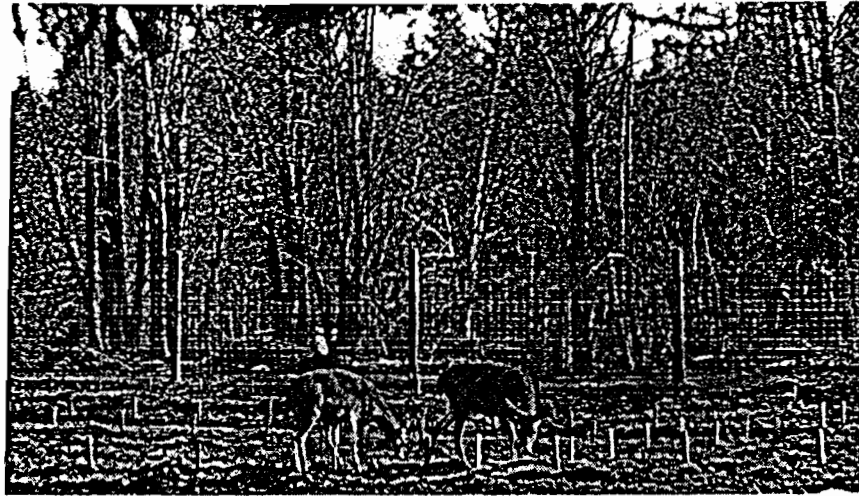
Forest wildlife damage management to improve forest health

By Dan L. Campbell

Healthy forests are essential to the well-being of wildlife populations, yet there are a variety of forest animals that complicate reforestation efforts by damaging seed, seedlings and maturing trees. Mammals ranging in size from deer mice to black bears and elk cause feeding injuries to Pacific Northwest forest crops.

Although artificial seeding with conifer seed has been almost totally replaced by transplanting seedlings, deer mice continue to impact sites in some interior forests that rely on natural seeding. Voles or meadow mice inhabit old fields or grassy sites and clip or girdle planted trees. Vole populations usually fluctuate more than most other species and damage to trees can be significant in years with high numbers of animals. Douglas tree squirrels and western gray squirrels girdle the upper stems of trees about six inches diameter at breast height (dbh) and larger. Pocket gophers and mountain beavers (not related to stream beavers) are burrowing rodents that cause very severe losses in interior and coastal forests, feeding on trees above and below ground. Snowshoe hares are often a major problem in young plantations where they cut tree seedlings. Porcupine damage causes extensive losses primarily in interior forests; much of this loss results from deformed trees.

The large browsers, deer and elk, cause growth losses and tree seedling mortality throughout much of the Pacific Northwest. Black bears often girdle trees that could remain as crop trees after stands have been selectively



Proper seedling protection is essential. Here, black-tailed deer repellent tests are being conducted on Douglas-fir seedlings in pens in Olympia.

thinned. Since several of these species often occupy the same forest lands, they collectively cause diverse and serious problems for forest managers trying to establish a productive and healthy forest crop.

Interactions of wildlife and forestry

Large forest mammals provide extensive recreation and high quality food for many people. Most of the mammals have aesthetic significance, and others, such as the mountain beaver, usually unseen because of its burrowing and night time activity, have some unique physiological characteristics.

Porcupines, another example, have been an asset to studies conducted by university medical schools. Most of these forest mammals contribute by helping reduce vegetation that competes with the growth of commercial forest crops. Unfortunately, however, the plants eaten by these mammals include the desirable trees.

Feeding injury to tree seedlings such as Douglas-fir causes mortality or suppressed growth of the trees and increased growth by "weedy" trees and brush that would otherwise be shaded

out by the conifers. Brushy growth often necessitates repeated site preparation by brush removal and replanting the tree seedlings. Without proper seedling protection, the cycle of brush production may start over and over, ultimately leaving understocked forest land with a poor commercial tree crop for harvest. As the availability of timberland is reduced, it becomes more important to produce high quality forest products on the available land.

A relationship between insect damage to trees and subsequent increases in forest damage by pocket gophers is seen on many of the interior forest lands. The death of the overstory conifers caused by insects stimulates the growth of ground-level vegetation. Although this increases the carrying capacity of the site for some wildlife species, it also increases the population of pocket gophers. When these insect-killed trees are eventually harvested and reforestation is attempted, the pocket gophers usually clip and remove tree seedlings that are planted in what has become good pocket gopher habitat.

Similarly, coastal forests that are re-harvested and not immediately replanted are subject to severe tree seedling damage by snowshoe hares that occupy the sites as vegetation growth provides more cover. Recent forest management trends toward not burning logging slash to reduce smoke and to improve soil fertility may increase the need to protect tree seedlings planted



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in the "ready-made" cover provided by logging debris. The potential effects on forest quality that not removing slash may have on deer, elk and mountain beaver damage need further evaluation.

Predicting and preventing damage

Damage can usually be defined as an economic loss to the owner of forest land. Some management activities can be coordinated to help predict problems. Landowners preparing to harvest coastal forest lands are advised to identify and map the locations of mountain beaver burrow systems during cruising or other pre-harvest activities. Active burrow systems can then be scheduled for trapping before planting or for installation of rigid plastic mesh seedling protectors on tree seedlings that will be planted.

Deer and elk damage can often be predicted for sites adjacent to similar habitats that have been damaged from browsing or pulling of planted seedlings.

As the acreage of units being harvested is downsized, particularly on public lands, the likelihood of browsing damage increases because of the higher use resulting from close proximity of cover. Deer browsing in spring can usually be tolerated on about 30 percent of the tree seedlings in a two- or three-year-old forest plantation. If more than about 15 percent of newly planted seedlings are browsed during the first year, there is a strong possibility that browsing will be excessive in following years. When browse damage is low, growth from lateral buds that form new terminals will compensate for loss of the original seedling terminals. Habitat improvement by seeding newly logged sites with preferred native forbs that do not compete with tree seedling growth has been demonstrated to help keep browsing levels low.

Other damage prevention methods for use on sites with poor forage include the use of rigid mesh seedling protectors and proven chemical repellents. Repellents will normally provide only short-term protection for a spring flush or a late winter damage period, but may be adequate on sites when animal problems are seasonal or intermittent.

Potential damage from pocket go-

phers can usually be determined by survey of sites for recent mound building activity in summer or fall, and by determining the frequency of soil casts made in snow that are evident in spring. Few new mounds are made in spring. Control of pocket gopher populations by baiting with rodenticides is often effective, but recovery of those populations should be expected within a year.

Temporary reduction of populations of burrowing rodents by trapping or baiting can be expected without paralleled efforts to reduce reinvasion of the burrow systems. Experimental removal of mountain beaver nests has slowed reinvasion of those burrow systems, but further research on methods of reducing rodent reinvasion of forested sites is needed.


Species diversity

Trends toward establishing more diverse plantings of conifers and encouraging a diversity of wildlife species within forest stands have both benefits and detrimental aspects in managing mammal damage to plantations. True firs are often less palatable to most forest mammals than Douglas-fir. Western hemlock is usually intermediate in preference. Most pines are palatable to pocket gophers and other rodents, but usually less preferred by big game species. Western redcedar


ranks very high in palatability, probably nearly as palatable as Pacific yew, which is now valued for its chemical properties against cancer. Hybrid cottonwoods are highly palatable to deer and elk. Protection of preferred species should be considered when plantations are being established.

Increasing habitat diversity and manipulations of forest habitats as a means of reducing forest damage by mammals is a concept that has received little research. Because of the long growing periods for forest crops, long-range studies of forest mammals are needed to determine how wildlife populations can be effectively managed in a healthy forest environment that also produces income.

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